

In the Claims:

A complete listing of all claims 1-114 in the present Application is as follows:

1. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

a device table;

a stage mover assembly connected to the device table, the stage mover assembly moving the device table;

a holder assembly including a device holder that retains the device and rotates relative to the device table; and

a holder mover assembly that rotates the device holder at least approximately five degrees relative to the device table between a first position and a second position.

2. (Original) The stage assembly of claim 1 wherein the holder mover assembly rotates the device holder at least approximately twenty-five degrees relative to the device table about a holder axis of rotation between the first position and the second position.

3. (Original) The stage assembly of claim 1 wherein the holder mover assembly rotates the device holder at least approximately one hundred and eighty degrees relative to the device table about a holder axis of rotation between the first position and the second position.

4. (Original) The stage assembly of claim 1 wherein the stage mover assembly moves the device table to rotate the device holder relative to the device table.

5. (Previously Presented) The stage assembly of claim 1 wherein the holder mover assembly includes a stop that engages the holder assembly and provides a stop axis of rotation for the device holder.

6. (Original) The stage assembly of claim 5 wherein the device holder rotates relative to the stop about the stop axis of rotation and wherein the device holder rotates relative to the device table about a holder axis of rotation.

7. (Original) The stage assembly of claim 5 wherein the stop engages the device holder.

8. (Original) The stage assembly of claim 5 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table and wherein the stop engages the carrier.

9. (Original) The stage assembly of claim 1 wherein the stage mover assembly moves the device table in a semi-circular path to rotate the device holder relative to the device table.

10. (Original) The stage assembly of claim 1 wherein the device holder rotates relative to the device table about a holder axis of rotation and the holder assembly has an assembly center of gravity that is offset from the holder axis of rotation.

11. (Original) The stage assembly of claim 10 wherein the stage mover assembly accelerates the device table to rotate the device holder relative to the device table.

12. (Original) The stage assembly of claim 10 wherein the stage mover assembly accelerates the device table to stop rotation of the device holder relative to the device table.

13. (Original) The stage assembly of claim 10 wherein the device holder has a holder center of gravity that is offset from the holder axis of rotation.

14. (Original) The stage assembly of claim 10 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table and wherein the carrier has a carrier center of gravity that is offset from the holder axis of rotation.

15. (Original) The stage assembly of claim 1 wherein the stage mover assembly accelerates the device table to rotate the device holder relative to the device table.

16. (Original) The stage assembly of claim 15 wherein the stage mover assembly accelerates the device table to stop rotation of the device holder relative to the device table.

17. (Original) The stage assembly of claim 1 wherein the holder mover assembly includes a motor that engages the holder assembly.

18. (Original) The stage assembly of claim 17 wherein the motor engages the device holder.

19. (Original) The stage assembly of claim 17 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table and the motor engages the carrier.

20. (Original) The stage assembly of claim 17 further comprising a stage that moves and supports the device table, wherein the motor is secured to the stage.

21. (Original) The stage assembly of claim 20 further comprising a damper that secures the motor to the stage, the damper inhibiting disturbance forces from the motor from being transferred to the stage.

22. (Original) The stage assembly of claim 17 wherein the motor is secured to an apparatus frame.

23. (Original) The stage assembly of claim 17 wherein the motor is secured to the device table.

24. (Original) The stage assembly of claim 23 further comprising a damper that secures the motor to the device table, the damper inhibiting disturbance forces from the motor from being transferred to the device table.

25. (Original) The stage assembly of claim 1 wherein the holder mover assembly includes a first component and a second component that interacts with the first component, the first component being secured to the holder assembly.

26. (Original) The stage assembly of claim 25 wherein the first component is secured to the device holder.

27. (Original) The stage assembly of claim 25 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table and wherein the first component is secured to the carrier.

28. (Original) The stage assembly of claim 25 wherein the second component is secured to the device table.

29. (Original) The stage assembly of claim 28 further comprising a damper that secures the second component to the device table, the damper inhibiting disturbance forces from the mover from being transferred to the device table.

30. (Original) The stage assembly of claim 25 further comprising a stage that moves and supports the device table, wherein the second component is secured to the stage.

31. (Original) The stage assembly of claim 30 further comprising a damper that secures the second component to the stage, the damper inhibiting disturbance forces from the second component from being transferred to the stage.

32. (Original) The stage assembly of claim 25 wherein the second component is secured to an apparatus frame.

33. (Original) The stage assembly of claim 25 wherein the second component is secured to a damper.

34. (Original) The stage assembly of claim 25 wherein one of the components includes a magnet array and the other component includes a conductor array.

35. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 1 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.

36. (Currently Amended) A process for manufacturing a device including the steps of (i) providing a substrate, (ii) moving the substrate, and (iii) transferring an image onto the substrate with the exposure apparatus of claim 35.

37. (Previously Presented) A process for manufacturing a wafer including the steps of (i) providing a substrate, (ii) moving the substrate, and (iii) forming an image on the substrate with the exposure apparatus of claim 35.

38. (Previously Presented) A method for making a stage assembly for moving a device, the method comprising the steps of:

providing a device table that is supported movably;  
connecting a stage mover assembly to the device table;  
providing a holder assembly including a device holder that retains the device; and

providing a holder mover assembly to rotate the device holder at least approximately five degrees relative to the device table between a first position and a second position.

39. (Currently Amended) The method of claim 38 wherein the holder mover assembly rotates the device holder at least approximately twenty-five degrees relative to the device table about a holder axis of rotation between the first position and the second position.

40. (Currently Amended) The method of claim 38 wherein the holder mover assembly rotates the device holder at least approximately one hundred and eighty degrees relative to the device table about a holder axis of rotation between the first position and the second position.

41. (Original) The method of claim 38 wherein the stage mover assembly moves the device table to rotate the device holder relative to the device table.

42. (Previously Presented) The method of claim 38 wherein the holder mover assembly includes a stop that engages the holder assembly and provides a stop axis of rotation for the device holder.

43. (Original) The method of claim 42 wherein the stop engages the device holder assembly and provide a stop axis of rotation for the device holder.

44. (Original) The method of claim 42 wherein the holder assembly includes a carrier that supports the device holder and wherein the stop engages the carrier.

45. (Original) The method of claim 42 wherein the stage mover assembly moves the device table in a semi-circular path when the device holder rotates between the first position and the second position.

46. (Original) The method of claim 38 wherein the device holder rotates relative to the device table about a holder axis of rotation and the holder assembly has an assembly center of gravity and that is offset from the holder axis of rotation.

47. (Original) The method of claim 46 wherein the stage mover assembly accelerates the device table to rotate the device holder relative to the device table.

48. (Original) The method of claim 46 wherein the stage mover assembly accelerates the device table to stop rotation of the device holder relative to the device table.

49. (Original) The method of claim 38 wherein the holder mover assembly includes a motor that engages the holder assembly.

50. (Original) The method of claim 49 wherein the motor engages the device holder.

51. (Original) The method of claim 49 wherein the holder assembly includes a carrier that support the device holder and the motor engages the carrier.

52. (Original) The method of claim 49 further comprising the step of providing a stage that supports the device table and the step of securing the motor to the stage.

53. (Original) The method of claim 52 further comprising the step of connecting the motor with a damper to the stage, the damper inhibiting disturbance forces from the motor from being transferred to the stage.

54. (Original) The method of claim 49 further comprising the step of providing an apparatus frame and the step of securing the motor to the apparatus frame.

55. (Original) The method of claim 54 further comprising the step of connecting the motor with a damper to the apparatus frame, the damper inhibiting disturbance forces from the motor from being transferred to the apparatus frame.

56. (Original) The method of claim 49 further comprising the step of securing the motor to the device table.

57. (Original) The method of claim 56 further comprising the step of connecting the motor with a damper to the device table, the damper inhibiting disturbance forces from the motor from being transferred to the device table.

58. (Original) The method of claim 49 wherein the motor includes a first component and a second component that interacts with the first component, the first component being secured to the holder assembly.

59. (Original) The method of claim 58 further comprising the step of securing the first component to the device holder.

60. (Original) The method of claim 58 further comprising the step of positioning a carrier between the device holder and the device table and the step of securing the first component to the carrier.

61. (Original) The method of claim 58 including the step of securing the second component to the device table.

62. (Original) The method of claim 61 further comprising the step of securing the second component with a damper to the device table, the damper inhibiting disturbance forces from the second component from being transferred to the device table.

63. (Original) The method of claim 58 including the step of providing a stage that supports the device table and the step of securing the second component to the stage.

64. (Original) The method of claim 63 further comprising the step of connecting the second component with a damper to the stage, the damper inhibiting disturbance forces from the second component from being transferred to the stage.

65. (Original) The method of claim 58 including the step of providing an apparatus frame and the step of securing the second component to the apparatus frame.

66. (Original) The method of claim 65 further comprising the step of connecting the second component with a damper to the apparatus frame, the damper inhibiting disturbance forces from the second component from being transferred to the apparatus frame.

67. (Original) The method of claim 58 wherein one of the first component and the second component includes a magnet array and the other component includes a conductor array.

68. (Original) A method for making an exposure apparatus that forms an image on an object, the method comprising the steps of:

providing an irradiation apparatus that irradiates the object with radiation to form image on the object; and

providing the stage assembly made by the method of claim 38.

69. (Currently Amended) A method of making a wafer including the steps of providing (i) a substrate, (ii) moving the substrate, and (iii) forming an image on the substrate utilizing the exposure apparatus made by the method of claim 68.

70. (Currently Amended) A method of making a device including the steps of (i) providing a substrate, (ii) moving the substrate, and (iii) transferring an image onto the substrate utilizing the exposure apparatus made by the method of claim 68.

71. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

a device table;

a stage mover assembly connected to the device table, the stage mover assembly moving the device table;

a holder assembly including a device holder that retains the device and rotates relative to the device table; and

a holder mover assembly that includes a stop that engages the holder assembly and provides a stop axis of rotation for the rotation of the device holder relative to the device table between a first position and a second position.

72. (Previously Presented) The stage assembly of claim 71 wherein the device holder rotates relative to the stop about the stop axis of rotation and wherein the device holder rotates relative to the device table about a holder axis of rotation.

73. (Previously Presented) The stage assembly of claim 71 wherein the stop engages the device holder.

74. (Previously Presented) The stage assembly of claim 71 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table and wherein the stop engages the carrier.

75. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 71 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.

76. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

- a device table;
- a stage mover assembly connected to the device table, the stage mover assembly moving the device table; and
- a holder assembly including a device holder that retains the device, the device holder rotating relative to the device table about a holder axis of rotation, and the holder assembly has an assembly center of gravity that is offset from the holder axis of rotation.

77. (Previously Presented) The stage assembly of claim 76 wherein the stage mover assembly accelerates the device table in order to rotate the device holder relative to the device table.

78. (Previously Presented) The stage assembly of claim 76 wherein the stage mover assembly accelerates the device table in order to stop rotation of the device holder relative to the device table.

79. (Previously Presented) The stage assembly of claim 76 wherein the device holder has a holder center of gravity that is offset from the holder axis of rotation.

80. (Previously Presented) The stage assembly of claim 76 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table and wherein the carrier has a carrier center of gravity that is offset from the holder axis of rotation.

81. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 76 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.

82. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

a device table;

a stage mover assembly connected to the device table, the stage mover assembly moving the device table;

a holder assembly including a device holder that retains the device and rotates relative to the device table, and a carrier that is positioned between the device holder and the device table; and

a holder mover assembly that includes a motor that engages the carrier, the holder mover assembly rotating the device holder relative to the device table between a first position and a second position.

83. (Previously Presented) The stage assembly of claim 82 further comprising a stage and a damper, wherein the stage supports the device table, and wherein the damper secures the motor to the stage, the damper inhibiting disturbance forces from the motor from being transferred to the stage.

84. (Previously Presented) The stage assembly of claim 82 further comprising a damper that secures the motor to the device table, the damper inhibiting disturbance forces from the motor from being transferred to the device table.

85. (Previously Presented) The stage assembly of claim 82 wherein the motor includes a first component and a second component that interacts with the first component, the first component being secured to the holder assembly.

86. (Previously Presented) The stage assembly of claim 85 further comprising a damper that secures the second component to the device table, the damper inhibiting disturbance forces from the mover from being transferred to the device table.

87. (Previously Presented) The stage assembly of claim 85 further comprising a stage and a damper, wherein the stage supports the device table, and wherein the damper secures the second component to the stage, the damper inhibiting disturbance forces from the second component from being transferred to the stage.

88. (Previously Presented) The stage assembly of claim 85 wherein the first component is secured to the carrier.

89. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 82 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.

90. (Previously Presented) The exposure apparatus of claim 89 further comprising an apparatus frame, and wherein the motor includes a first component and a second component that interacts with the first component, the first component being secured to the holder assembly and the second component being secured to the apparatus frame.

91. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

a device table;

a stage that supports the device table;

a stage mover assembly connected to the stage, the stage mover assembly moving the stage and the device table;

a holder assembly including a device holder that retains the device and rotates relative to the device table;

a holder mover assembly that includes a motor that rotates the device holder relative to the device table between a first position and a second position; and

a damper that secures the motor to the stage, the damper inhibiting disturbance forces from the motor from being transferred to the stage.

92. (Previously Presented) The stage assembly of claim 91 wherein the motor includes a first component and a second component that interacts with the first component, the first component being secured to the holder assembly and the second component being secured to the stage with the damper.

93. (Previously Presented) The stage assembly of claim 92 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table, and wherein the first component is secured to the carrier.

94. (Previously Presented) The stage assembly of claim 91 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table, and wherein the motor engages the carrier.

95. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 91 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.

96. (Previously Presented) An exposure apparatus for transferring an image to a device, the exposure apparatus comprising:

an apparatus frame; and  
a stage assembly that moves the device, the stage assembly comprising:  
a device table; a stage mover assembly connected to the device table, the stage mover assembly moving the device table; a holder assembly including a device holder that retains the device and rotates relative to the device table; and a holder mover assembly that includes a motor that engages the holder assembly and rotates the device holder relative to the device table between a first position and a second position; wherein the motor is secured to the apparatus frame.

97. (Previously Presented) The exposure apparatus of claim 96 wherein the motor includes a first component and a second component that interacts with the first component, the first component being secured to the holder assembly and the second component being secured to the apparatus frame.

98. (Previously Presented) The exposure apparatus of claim 97 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table, and wherein the first component is secured to the carrier.

99. (Previously Presented) The exposure apparatus of claim 96 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table, and wherein the motor engages the carrier.

100. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

- a device table;
- a stage mover assembly connected to the device table, the stage mover assembly moving the device table;
- a holder assembly including a device holder that retains the device and rotates relative to the device table;
- a holder mover assembly that includes a motor that engages the holder assembly, the holder mover assembly rotating the device holder relative to the device table between a first position and a second position; and
- a damper that secures the motor to the device table, the damper inhibiting disturbance forces from the motor from being transferred to the device table.

101. (Previously Presented) The stage assembly of claim 100 wherein the motor includes a first component and a second component that interacts with the first component, the first component being secured to the holder assembly and the second component being secured to the device table with the damper.

102. (Previously Presented) The stage assembly of claim 101 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table, and wherein the first component is secured to the carrier.

103. (Previously Presented) The stage assembly of claim 109 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table, and wherein the motor engages the carrier.

104. (Previously Presented) The stage assembly of claim 100 further comprising a stage that supports the device table.

105. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 100 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.

106. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

a device table;

a stage mover assembly connected to the device table, the stage mover assembly moving the device table; and

a holder assembly including a device holder that retains the device and rotates relative to the device table, wherein the stage mover assembly moves the device table in a semi-circular path in order to rotate the device holder relative to the device table between a first position and a second position.

107. (Previously Presented) The stage assembly of claim 106 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table.

108. (Previously Presented) The stage assembly of claim 106 further comprising a stage that supports the device table.

109. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 106 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.

110. (Previously Presented) A stage assembly that moves a device, the stage assembly comprising:

a device table;

a stage mover assembly connected to the device table, the stage mover assembly moving the device table; and

a holder assembly including a device holder that retains the device and rotates relative to the device table, wherein the stage mover assembly accelerates the device table in order to rotate the device holder relative to the device table between a first position and a second position.

111. (Previously Presented) The stage assembly of claim 110 wherein the stage mover assembly accelerates the device table in order to stop rotation of the device holder relative to the device table.

112. (Previously Presented) The stage assembly of claim 110 wherein the holder assembly includes a carrier that is positioned between the device holder and the device table.

113. (Previously Presented) The stage assembly of claim 110 further comprising a stage that supports the device table.

114. (Currently Amended) An exposure apparatus for manufacturing a device from a substrate, the exposure apparatus including the stage assembly of claim 110 moving the substrate, and an illumination system that directs an energy beam that transfers the image to the substrate.